

..... **DIVISION OFFICE**
INSPECTION GUIDE (METRIC VERSION)
1999 INSPECTION IN-DEPTH - Portland Cement Concrete Paving and Plant

Project Data:

Project No.:
County:
Inspection Made By:
In Company With:
Date of Inspection:
Percent Work Complete:
Percent Time Lapsed:
Contractor:
Contract Amount:

References:

This guideline was prepared utilizing requirements and recommendations in the "1994 Standard Specifications"; July 1, 1998, Supplemental Specifications; the "DOH Construction Manual, 1980"; Standard Details, Volume I, and the following Materials Procedures:

- a. 300.00.51 - Procedural Guidelines for Maintaining Control Charts for Aggregate Gradation, dated November 1976.
- b. 601.03.50 - Guide for Quality Control and Acceptance Requirements for Portland Cement Concrete, dated November 1976.
- c. 601.03.51 - Standard Method for Determination of A(Bar) of the Total Solids in Portland Cement Concrete.
- d. 601.03.52 - Procedural Guidelines for Maintaining Control Charts for Portland Cement Concrete, revised October 1978.
- e. 601.04.20 - Curing Concrete Test Specimens in the field.
- f. 700.00.30 - Certification of Batch Scales and Calibration of Standard 50 Pound Weights, Revised November 1985.
- g. 711.03.23 - Mix Design for Portland Cement Concrete, April 1971.
- h. 711.03.26 - Maintaining Specified Level of Strength in Portland Cement Concrete, December 1981.

Also, the listing of AASHTO test methods included in Section 501.4.1 should be referenced.

The checks included in the guideline are considered to be the major items and can be supplemented as deemed necessary by the inspecting party. It is suggested that, prior to any inspection, a review of all applicable provisions be made in order that a broad knowledge of the provisions can be achieved and utilized during the inspection.

A. Field Portion (Roadway)

1. Equipment

- a. Does the contractor's equipment meet the requirements of the specifications and appear capable of performing the jobs intended?

Haul units -

Paver -

Finishing Machines -

Concrete Saws (stand by saw & extra blades) -

Forms (true to line & cleaned) -

Vibrators -

- b. Does contractor have protective covering on hand in case of rain?
- c. If slipforming, are wood or metal planks on hand for side reinforcement?

2. Preparation

- a. If forms are being used, are they
 - firmly supported?
 - staked?
 - oiled?
- b. If slipforming, does the base have adequate width and appear true to typical section in areas that support the tracks of paving train?
- c. Are wire guides and string lines satisfactory?
- d. If an aggregate base material is being utilized beneath the PCCP, is it being kept sufficiently moist to prevent drawing of moisture from the concrete?
- e. Are load transfer assemblies
 - aligned properly?
 - coated?
 - placed an adequate distance in advance of paving train?
 - appropriately marked to insure the proper location of sawed joints?

3. Placement

- a. If transit or agitating trucks are used, is concrete being discharged within 60 minutes after water is added?
(30 minutes if non-agitating trucks are used)
(45 minutes when the concrete temperature exceeds 30°C)?
- b. If water is added at the paving site, are the required revolutions achieved without exceeding the maximum allowable revolutions?
- c. Is the discharge of concrete from the haul unit satisfactory?
- d. Is the concrete temperature at least 10°C, but not more than 30°C?
- e. If the temperature in the shade exceeds 30°C, are concrete temperatures being taken every hour to insure that the concrete remains below 32°C?
- f. If slipforming, is care taken to insure that no material gets under the tracks on any of the finishing machines?
- g. Is there any evidence of creep of the reinforcement at the joints?

- h. With regard to the vibrators, indicate
 - number employed
 - frequency
 - adequacy (particularly at load transfer units)
- i. Are depth checks being taken with regard to the overall thickness?

4. Testing

- a. Where is the testing being conducted?
- b. Has the following items met the specified requirements:
 - air content (7% + 2.5)
 - consistency
- c. Observe the testing of delivered concrete and comment on:
 - qualifications of the contractor's certified technician
 - condition of the contractor's testing equipment

Air Content (%)	Consistency (mm)	Temperature °C	
		Air	Concrete

5. Finishing

- a. Is the surface being finished with a minimum of floating and with no water being added to aid in finishing?
- b. Is a 3 meter straight-edge being used to check the concrete surface while it is still plastic in order to make corrections to the surface if necessary?
- c. If slipform paving, is the edge slump zero when an adjacent lane or concrete shoulder is to be placed?
- d. Are the station numbers being placed in the plastic pavement every 20 meters on the outside EOP approximately 6 mm deep, parallel to the transverse joints, and 300 to 600mm from the EOP?

6. Texturing

- a. Is the transverse grooving being performed at the proper time when the concrete has set enough to maintain the groove, yet is still plastic enough such that the required depth of 3 to 5 mm can be achieved?
- b. Are there any overlapping grooves (a small gap between succeeding passes is better)?

7. Curing

- a. Are curing procedures being utilized as soon as the concrete surface will not be marred?

- b. If white pigmented curing compound is being used, is it being applied under pressure from a continuously agitated tank?
- c. Are field checks being made on the application rate?

8. Joints

- a. If longitudinal joints are being sawed, are they being sawed within 4 to 24 hours of placement?
 - Are the joints within the required tolerances?
($D = T/3$; $W = 6 \text{ mm} + 2 \text{ mm}$)
- b. What type of transverse joint sealant is being used?
(silicone sealant or preformed)
- c. Is the initial sawing of transverse joints conducted within 4 to 24 hours of placement?
 - Are they within the required tolerances?
($D = T/3$; $W = 3 \text{ mm}$ (silicone) or 8 mm max. (preformed))
- d. Is the final sawing of transverse joints performed when the concrete has hardened sufficiently but no earlier than 72 hours after placement of concrete?
- e. Are they within the required tolerances? ($W = 10 \text{ mm} \pm 2 \text{ mm}$)
($W = 10 \text{ mm} \pm 2 \text{ mm}$)
- f. Are there any random cracks within 75 mm of any transverse joint?

B. Field Portion (Concrete Plant)

- 1. Has the concrete plant been checked by Materials personnel and certified as satisfactory on an inspection checklist type form?
- 2. Type of Plant?
- 3. Diary
 - a. Who maintains the plant diary?
 - b. Is it up to date?
 - c. Does it contain the required information such as:
 - Materials received and used
 - Moisture tests
 - All calibrations, verifications, and checks
 - Weather conditions
 - Starting and ending times
 - Instructions to the contractor
- 4. Is all required information readily available, such as:
 - Approved mix design?
 - Batch Weights?

- Contractor's quality control plan?
5. Control Charts
 - a. Are the control charts up to date?
 - b. Are any of the test results approaching or exceeding the outer range?
 6. Are moisture tests being performed and documented on the fine aggregate in accordance with the quality control plan?
 7. Is the laboratory in close proximity of the plant?
 8. Scales
 - a. Are at least 10 - 20 kg weights on hand for the required scale testing?
 - b. Are the scales being checked for zero balance and sensitivity as required in the quality control plan?
 9. Stockpiles
 - a. Are the aggregates being stored in a manner to avoid intermixing, segregation, and contamination?
 - b. Is the loader operator performing his function correctly?
 - c. Is the coarse aggregate being maintained in a saturated surface dry condition?
 10. Have all haul trucks been inspected in compliance with the specifications?

C. Office Portion

1. Mix Design
 - a. Submittal date?
 - b. Approval date?
 - c. Does the mix design meet the following requirements? (Table 501.3.1)
 - Minimum strength 20.7 MPa
 - Minimum cement 335 kg/cubic meter
 - Maximum water 163.4 liters/cubic meter
 - Coarse aggregate 357, 467, 57 or 67
 - d. Where are the sources for the following materials?
 - Coarse aggregate
 - Fine aggregate
 - Cement
 - Flyash
 - Air entraining agent

- Water reducer agent

2. Quality Control Plan

- a. Submittal date?
- b. Approval date?
- c. Does the quality control plan meet the minimum requirements of MP 601.03.50?

3. Pick a date at random when the PCCP operation was in progress and check the subgrade, base and concrete items with cross checking of the supervisor's daily reports, inspector's daily reports (IDR's) and HL-440's for proper documentation of materials used, pay items involved, and required field tests and results.

- a. Dates of PCCP
- b. Locations
- c. Subgrade (eg., compaction, thickness, line and grade, material tests)

- Diary
- Daily inspector's report
- HL-440's

- d. Base (eg., compaction, thickness, line and grade, material tests)

- Diary
- Daily inspector's report
- HL-440's

- e. PCCP (eg., mixing times, water added, revolutions, equipment check, vibration frequency, depth checks, concrete tests, straight edging, curing, dowels, tie bars, etc.)

- Diary
- Daily inspector's report
- HL-440's

4. Review any core drilling results taken to date:

5. Review the records of casting and testing of cylinders for opening the pavement to traffic:

6. Has the pavement smoothness been determined using a GM profilometer or Mays Road Meter?

- Price Adjustment?

7. What is the status of the Independent Assurance Sampling?

8. Have a general discussion of the entire PCCP operation and note any significant problems. Also note any suggestions on changes in any procedures or requirements that might better improve the process or product.

9. Do you have any recommendations for improvements in the area of PCCP paving?

10. Hold a closeout conference and discuss all findings and come to an agreement on corrective actions

when required.